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NARRATIVE OF THE WRECK OF THE STRATHMORE.

BY ONE OF THE SURVIVORS.

THE *Strathmore* was an iron vessel of one thousand four hundred and ninety-two tons, and acknowledged to be as fine a ship of her class as ever left the port of London. Her commander, Captain Macdonald, besides being a worthy man, was an experienced and careful seaman. His first officer, Mr Ramsay, was also a sailor of the right type; but of the crew, generally, that could not be said, although there were some good men among them. We mustered a crew of thirty-eight, men and boys; passengers of the three classes, fifty-one; in all, eighty-nine souls. This was the clipper's first voyage, and our destination was Otago, New Zealand. The ship's cargo was principally railway iron; but along with other things we had candles and spirits, and a still more inflammable item, immediately to be mentioned. We left the docks on the 17th of April 1875, and dropped down the river below Gravesend to complete our cargo, by taking aboard twenty tons of gunpowder, which having been stored, all the arrangements for sailing were complete; and, heaving anchor, we bade farewell to England about midnight of the 19th of April.

We got very pleasantly out of the Channel, and, owing to the course we steered, we in a great measure avoided that landsman's terror, the swell of the Bay of Biscay. A head-wind now came on, which continued for a fortnight, driving us right across towards America. When that had ceased we had a fair wind, but so slight that at times we did not make more than a quarter of a mile an hour. After a time more fitting breezes blew; we had now somewhat settled down to life on board ship, the weather had become exceedingly hot, and we betook ourselves to such light amusements as suited the temperature; some to reading, some to whist and backgammon, others 'spinning' or listening to a yarn.

I and three friends occupied one cabin; Fred

Bentley, and two brothers, Percy and Spencer Joslen. Our meals were always welcome, agreeably breaking the monotony of life at sea. When we had been out about ten days the routine was rather unpleasantly varied by the discovery that the crew had broken into the cargo and abstracted a couple of cases of spirits. This might not have been so soon found out, had the knaves not got so helplessly drunk that they were incapable of work. For a day or two they were insubordinate, and the passengers had to assist in working the ship. This matter, however, blew over, and things fell into the ordinary course. So reckless were these men that they were seen (as we afterwards learned from a third-class passenger) in the vicinity of the gunpowder with a naked candle!

On the 20th of May we had a thunder-storm so terrific, that from its exciting effects some of the ladies were confined to their berths nearly all next day. To me and my companions it was a scene grander of the kind than we had ever witnessed in our northern latitudes. No ordinary language could describe it.

On the following day, May 21st, we were hailed by the *Loch Maree*, homeward bound, and short of provisions; latitude 4° 20' north. Our captain having supplied this ship with such stores as he could spare, we sent letters home by her. We were spoken by the *Borealis* on the 27th of May, and for the last time by the *Melpomene* on the 8th of June. We had this vessel in sight for two days.

Passing over the amusements incidental to crossing the line, nothing of importance occurred while proceeding in a south-easterly direction, till we had rounded the Cape of Good Hope, and got fairly into the Southern Ocean. This vast expanse of sea, between latitude 40 degrees and 50 degrees, is dotted with several groups of small desolate islands, requiring to be shunned with all the care of the navigator. At mid-day of the 30th June we were eighty-seven miles from one of these dangerous groups, called the Crozet Islands; and running at the rate of six knots an hour, we expected them

to be in sight by next morning, the 1st of July. A good look-out was kept. But two circumstances baffled every precaution. There was an error in the compass,* and a fog settled down on the horizon; the result being that the captain believed we were ten or fifteen miles farther south than we really were. Hence the dreadful fatality that ensued. At a quarter before four in the morning of the 1st July, when in my berth, I felt the ship strike on one of these wretched Crozet Islands. I hurriedly dressed, and my friend Bentley went to warn the ladies, whom he already found up and hastily attired. The ship had got wedged in a cleft in the rock. This, our partial escape from destruction, appeared to us little short of a miracle, for had she struck a few feet on either side, our ship, good though she was, must inevitably at once have gone down. She hung by the fore-part, with a list to starboard, her stern being submerged in deep water.

Bentley and I with others made for the port-quarter boat, but we could not get it off the davits, as a sea broke over us and washed us forward to the hand-rail of the poop. All from the poop forward was now rapidly getting under water to midship. The captain, seemingly greatly distressed, yet with characteristic disregard of self, gave orders as to the boats, directing that the women should be looked to first; his chief officer, Mr Ramsay, another fine fellow, also doing all that was possible in the short time left to them. Unhappily for them and for us, the second or third wave that washed over the ship carried away these good men, all of whom were respected and lamented. A number of the people got into the port lifeboat, including Mrs Wordsworth (the only lady saved), and Messrs Bentley and Spencer Joslen. A sea came and took this boat off the chocks. She fell back and partly stove in her bottom, but rose and floated across the poop, and finally left the ship, to the wonder of every one, without capsizing. It was in endeavouring to leap into this boat that our poor friend Percy Joslen was lost. The gig, with others of the crew and passengers, followed in charge of the second mate; and after her the dinghey in charge of the third mate, about nine o'clock A.M.

To resume my personal experience. The boats left us going towards the rocks, which we saw in front of us about one hundred yards off, rising like a wall several hundreds of feet out of the water. I should have mentioned that, for the time, having parted company with Bentley, I, to save myself, took to the mizzen rigging. There I remained with others until daybreak, by which time the ship had gone under water, all but the fore-castle head. On day breaking, I got along the mizzen top-gallant stay to the main-mast; and from there, down the main-stay, to the roof of the deckhouse. There was a heavy swell, but every wave did not break over us. Several others scrambled to the same place. We then went on to the fore-castle.

Late in the afternoon the gig returned and took away five passengers whom we had not before seen, and who had been clinging to the mizzen-top.

* The error may have arisen from the proximity of the ship to the Crozets, whose rock-bound coast abounds in compass-deranging ironstone. Or, the compasses of the ship—which perhaps was not properly 'swung' before leaving port—may have been affected by her cargo of iron.

They went off, and we were left shivering in the cold, the lateness of the day rendering it impossible for the boat to return. We passed a miserable night. Our position was one of great peril, as we felt the vessel rising and falling with the flowing and receding wave; we not knowing but that the next wave would liberate and sink our ill-fated ship—as was the case a few hours after we left her. We had nothing to subsist on but a few biscuits, and were almost frozen by the wet and extreme cold. About ten A.M. of the second day, the gig returned, bringing back the hope of life which had almost left us. This boat took us all off, the last remaining being myself, another passenger, and nine of the crew. The sea had now become more calm, and we got to the landing-place, about a mile and a half to the south-east of where our ship had struck; this place had been discovered by the first boat; and a rope had been fixed to the cliff, by which we climbed up the rock.

As the morning of the wreck was nearly pitch dark and the incidents were too crowded, many occurred which did not come under my personal observation. Miss Henderson was swept from the deck by an early wave; her brother survived, to die a more lingering death on the island. Mrs Walker fell a victim to her maternal feelings, as she would not enter the boat without her child. It had been taken by the second mate, and placed in charge of the second steward in the rigging. One of the ship's apprentices, much to his credit, gave up, on request, a life-buoy to one of the passengers. Terrible as the circumstances of this sad morning were, it is surprising the outward composure that was maintained throughout. I did not hear even one scream from the women. Mrs Wordsworth shewed great self-possession. When all landed and collected, we found forty lives had been lost, including one entire family of ten. George Mellor, a third-class passenger, died ashore of exhaustion the second night, and was buried in the sea.

Upon landing, I was regaled with a leg of a young albatross (of which and other birds there was fortunately a considerable store on the island) roasted; and after having been thirty hours on the wreck, I need scarcely say that I never tasted anything sweeter. A glance at the sterile rock on which the fates had driven us, and on which we were to live if we could for an indefinite time, shewed that, compared with it, Crusoe's island was as the garden of Eden. We were on Apostle Island, which, to judge by the guano-deposit, must have been the home of sea-birds for ages, and on which, very probably, the foot of man had but seldom if ever trod.

Before entering on the subject of our life on the island, it may be as well to give a brief account of the group of islands of which ours was one. The Crozet Islands are a volcanic group to the south of the Indian Ocean, lying between Kerguelen's Land on the east and Prince Edward's Islands on the west. They take their name from Crozet, a French naval officer. Apostle Island, on which we were, was the largest of the reef of rocks called the Twelve Apostles, forming part of the group. Large and small, islands and rocks inclusive, are twenty-six in number.

We spent the first and second nights ashore very miserably, owing to the cold and damp. My first night—the second since the wreck—I, along with five others, lay under a rock; next night we all

got into a shanty which had been built, but we were so closely packed that it was not possible to sleep. Therefore next night, Bentley, Henderson, and I went back to the rock, under the ledge of which we slept for several weeks. Before we got more sheltered, by building up a wall of turf, we were sometimes, in the morning when we awoke, covered with two or three inches of snow. Little of any value was saved from the wreck; some clothes were got out of the fore-castle; and a passenger's chest, containing sheetings, blankets, table-covers, knives, forks, spoons, and a few other things, was picked up on return to the ship by the life-boat. The boats picked up, floating, a cask of port-wine, two cases of gin, two cases of rum, one of brandy, one of pickles, some fire-wood, and a cask of ladies' boots, which were not of much use to us; also a case of confectionery, the tins of which became very serviceable as pots for culinary purposes.

Two barrels of gunpowder also were found, and matches; also some deck-planks and other pieces of timber were secured, which were useful for our fires. When the wood was exhausted, we discovered that the skins of the birds made excellent fuel. During the night of the 3d July, the boats moored to the rocks broke away and were lost. This was greatly deplored at the time; but I consider it a fortunate circumstance, for, the ship having sunk, the only flotation that would have been recoverable was spirits, which perhaps we were better without. And for another reason: with the boats we might have been tempted to visit, and perhaps remain on Hog Island, which appeared about six miles off. We should have had a greater variety of food there, and probably altogether less privations and discomfort than we were subjected to on Apostle Island; but we would have been more out of the course of ships going to Australia or New Zealand, so that our rescue might have been much longer delayed.

The want of controlling authority was soon apparent in our small community. There was no one capable of exercising that influence, which by judgment, firmness, and a sense of justice, supported by the well-disposed, would have kept in check the troublesome spirits, who, however, were a small minority. Disciplinary power being wanting, the turbulent element was on the ascendant for some weeks after our landing. At length matters subsided into comparative order; but there never was perfect confidence. It was found advisable, for the general advantage, that we should be separated into parties; subsequently, into as many as six squads. This segregation was effected by a kind of natural affinity in the combining elements.

Mrs Wordsworth lived for a considerable time in the large shanty, until a smaller one was given up for the sole use of her and her son. This lady was ill during nearly the whole time of our sojourn on the island, but bore the privations she was subjected to with great fortitude. Little could be done to alleviate the hardships she suffered; she received such attention as the limited means at hand afforded; and was throughout treated with general respect. For instance, when dinner was served, each man passed his hat for his share of fowl; Mrs Wordsworth's was handed to her on a piece of board.

A Bible had been saved, which was read aloud, and psalms sung from time to time with great

fervency; and early teachings, which had lain long latent, were revived with great force in their application to our present condition. These readings had a peculiar solemnity when we were laying our dead in their graves. The emotions thus produced were with some probably transient, although at the time heartfelt; with others the impressions may be more lasting.

We found our island to be about a mile and a half long by half a mile in breadth; no wood grew on it, indeed a considerable part of it was bare rock; the rest of it was covered with rank grass, and an edible root with a top like a carrot, but not in any other respect resembling that useful esculent. We found this of great service to us, as it was our only vegetable, and grew plentifully; we ate the stalk at first, and afterwards the tops only; sometimes boiled, sometimes raw. It has been said that he was a brave man who first ate an egg; if that be admitted, I think some claim to courage may be made by our quartermaster 'Bill,' who, notwithstanding some warning jokes, first tested this plant, very much to our future benefit.

We were also fortunate in discovering an excellent spring of water, somewhat impregnated with iron, but imparting a quality which I believe was very favourable to our health. In our frequent and very necessary ablutions we used, in lieu of soap, the yolks of eggs and birds' livers; some made use of their blood for the same purpose, which I did not much incline to. When we landed on the island there were about two hundred of the albatross young and old, and notwithstanding the warning of the Ancient Mariner, we killed many of these fine and, to us, useful birds. We agreed, however, not to meddle with the eggs, that we might in due time have the benefit of the young birds. There were several hundreds of 'gray-backs' (Knot), a very few small white pigeons, sea and land ducks, and lots of 'whalers' (Ivory gull) and divers—birds about twice the size of a sparrow. These make their nests in the ground, about a foot or two deep. Mutton-birds were found for many months; they also make nests underground, but are rather more particular in selecting dry spots. They are about the size of a small hen, black feathered, and coated with fat, which, even raw, we considered a luxury. The molly-hawks (Fulmar petrel) came in about the middle of August: there were several hundreds of them. As soon as one lot was killed others came in; in all, there must have been five thousand, if not more. The first penguin was killed by the cook, I think on the 29th of September; only a few were seen within the next three days, but every day after that they came in hundreds. There must have been from time to time fully a million of these birds. We killed upwards of fifty thousand without making any apparent impression on their numbers. The albatross, which had left, returned to the island before we were taken off. This fine bird, that 'holds its holiday in the stormy gale,' I had heard say was fourteen feet in the expanse of its wings; but we had specimens on our rock that were seventeen feet from the extreme points of their extended pinions. Captain Carmichael (*Linn. Trans.* vol. xii.) says that the great albatross raises no nest, but merely selects some cavity for the reception of a single white egg; whereas those on our island raised a very fine high nest. It

nourishes its young by disgorging the oily contents of its stomach. The cock-bird comes to land first, as it were to select the spot for the hen-bird to deposit the egg; which, when laid by the hen, he sits on for days, while the lady-bird goes to sea.

The penguin, which feeds its young in the same way as the albatross, is a curious bird, having, in place of wings, two membranes which hang down at each side like little arms. It cannot fly. Its mode of walking is very singular, something between a waddle and a hop. As our rock was precipitous on all sides, the penguins came in where the rock was lowest, riding on the crest of the beating wave, often failing in their first attempts to land. When they touch the ground they march landward in Indian file, keeping good order; but are received as intruders by those already on shore. In fact their reception is most inhospitable; they are pecked at, and made to understand that they are not wanted: however, there is no blood shed, and they soon unite with the original settlers, in turn joining them in the assault on the next comers, or invaders, as they seem to think. They sit for about two months apparently without eating, and then return to the sea greatly emaciated. The penguin makes no preparation for the egg, dropping it anywhere. Their patient endurance is remarkable. They often sit on the egg until their tails, covered with icicles, are frozen to the ground. This strange bird appears quite in keeping with the remote and lonely islands in which it congregates and has congregated for untold generations. The molly-hawks too, fine large birds, rendered us good service as food.

The killing of the birds was at first very repugnant to us. The albatross was easily despatched; but the penguin was more tenacious of life, and though a harmless bird if left unmolested, at times shewed fight. The tedium of our life was mitigated by the necessity we were under in hunting these birds for our daily food; and the eggs which lay in hundreds around us were a very acceptable and nutritious article of diet, and contributed greatly to keeping up our strength.

We had recourse to many odd devices for table articles, such as gin and other bottles for drinking-cups, as long as they remained unbroken; then bladders, and penguin skins made into bags, into which we dipped a long hollow bone and imbibed the water, sherry-cobbler fashion. When we melted the fat of the birds it was poured into one of my sea-boots to cool, after which we put it into the skin-bags to keep. My other boot was used to hold salt water. Bentley's boots were taken to the spring for fresh water, and were the best pitchers we had. When we had to resort to the feathers for fuel, the food took a long time to prepare, and one meal was scarcely finished ere cooking was begun for the next. Each man was cook for a week at a time. In our shanty we cut off the foot of a sea-boot and used it as a drinking-cup. Bentley was very handy; he made needles out of wire, part of the rigging. As for thread, we drew it from a strong counterpane, and when that failed, we used dried grass. A knife was made from hoop-iron from a gin-case, one side of the handle from the top of a powder-keg, the other side from the blade of an oar, riveted with wire from the rigging, the washers being

made from a brass plate from the heel of my boot; also hands for a watch were fashioned from a plate likewise taken from my boot—all the work of Bentley. Our present abode was as truly the Rock of Storms, and as deserving of that title as ever the Cape was. The island was ever more or less tempest-beaten. Our hardships from cold, rain, and snow were very severe; in fact, we were never warm, and hardly ever dry.

As time passed on from days to weeks, and from weeks to months, without succour, we thought somewhat sadly of the anxiety of our friends at home; yet in our shanty at least, we never despaired of being ultimately rescued. We kept up our spirits as well as we could, holding our Saturday evening concerts—the song with the loudest chorus being the greatest favourite. We had among us a cynic, whom we knew to be engaged, and who prophesied that all our sweethearts would be married by the time we got home! We had sighted four ships, two of them coming near; one so near that we saw the man at the wheel. The captain of this ship made no sign of seeing us, but we afterwards learned that he *did* see us, but did not even report that he had, when he got into port. This behaviour on the part of one of our own countrymen contrasts painfully with the generous conduct of the gallant Americans who subsequently rescued us.

It would be bootless to narrate how from day to day we kept anxious watch; the record would be little more than a monotonous detail of disappointment, cheerless days, stormy weather, and bitterly cold nights. Our day on the look-out, which we took in turns, was a most wearisome duty. We had lost other four of our companions—five in all since we came ashore. Mr Stanbury, a young man from Dover, died on the 19th of July of lockjaw. Mr Henderson, who had been our companion on board ship and in our shelter under the rock, and who had become endeared to us by his good disposition, died of dysentery, after a long illness, on the 3d of September. We rendered him what assistance we could, but that was little. On the 23d of November, William Husband, an elderly seaman, died. On Christmas day, Mr Walker's child died. This was the last death on the island. It is curious that all the bodies after death were quite limp. I do not know whether this can be accounted for by the diet or some peculiar atmospheric condition. I have heard that death caused by lightning is followed by the same result. Another curious observation I made was that, if we cut ourselves, however slightly, the bleeding did not altogether cease for a couple of days. The antiseptic effect of the guano was shewn somewhat curiously. It was rumoured that one of the dead had been buried with a comb in his pocket; and one of our party wishing to obtain it, two months after the interment, found the body with no sign of decay.

January 1876 had now come. In view of the future, we had collected and stored over a hundred gallons of bird-oil for the use of our lamps, which we kept burning all night, the wicks made from threads drawn from sheets and other articles. We had also gathered many thousand penguin-skins for fuel. We had now to some extent become acclimatised, and were in better health than we were last year. We were put to great shifts for cooking utensils, our kitchen-ware being nearly

worn out, though we found some hollow stones, which we used as frying and stew pans. We had, soon after landing, erected flagstuffs, on which we placed a counterpane or blanket to attract the attention of ships that might come near us.

Early in January we resolved to build, on an eminence, a high square tower of turf, for the double purpose of drawing the notice of passing ships and serving as a shelter for the man on the look-out. The digging of the turf was a great difficulty, our only implements being our hands and a piece or two of hoop-iron. We were greatly retarded in our building by the unfavourable weather, the rain coming down heavily. A vessel passed us on the 14th of this month, but no notice was taken of our signals.

January the 21st was an eventful day: deliverance was at hand! About six o'clock in the afternoon we were all startled by a cry from the man on the look-out: 'Sail, ho!' We did not long delay in rushing up towards the flagstaff; we hoisted two flags, consisting of a piece of canvas and a blanket, one on the flagstaff and one on the unfinished tower; we kindled two fires, the smoke of which we calculated would be seen a good way off. The vessel did not at first seem to regard our signals; we were probably too impatient. She, however, soon made head towards us, when we became greatly excited; some, in their delight, cutting strange antics, in fact a genuine 'break-down.' When about a mile from our rock, to our great joy, she lowered two boats. They tried to effect a landing on the north side, but it was not possible. One of the boats coming nearer the rock, our sail-maker leaped into the water, and was hauled aboard. They then pulled to the point where we originally landed, Captain Giffard was in one of the boats. Night coming on, he told us that he could not take us off until next morning, but that he should leave us some bread and pork. However, upon being told that there was a lady ashore, he gallantly brought his boat as close to the rock as he prudently could, and took aboard Mrs Wordsworth, her son, two invalids, and the second mate. We spent this our last night on the island with little sleep, but with tumultuous feelings of joy and hope—for we were yet to see the friends who had long mourned us as dead.

Next morning, the vessel coming nearer, three boats came ashore for us. The carpenter having made four crosses of wood, they were placed to mark the graves of our unfortunate companions whose fate it was to rest in this lonely isle in the Indian Ocean, which we left with beating hearts and no regrets, and where we had spent six months and twenty-two days under very unusual conditions. I believe that the most thoughtless among us will remember with sobered feelings, and to his latest day, his sojourn on Apostle Island.

We were received on board the ship with the greatest kindness, being all provided with complete suits of new clothing, taken from the ship's stores. Mrs Wordsworth received every attention from Mrs Giffard, the captain's wife. The ship which relieved us was the *Young Phoenix* of New Bedford, an American whaler, commanded by Captain Giffard. Of this kind-hearted and generous sailor it is impossible for us to speak in terms too laudatory: we would be ungrateful indeed if we did

not keep him in lasting remembrance. I would fain hope that means will be found to reimburse him for the large pecuniary loss that, otherwise, his profusely unselfish generosity must involve.

On the 26th January we sighted the *Sierra Morena* of Liverpool, Captain Kennedy, bound to Kurrachee. As we overcrowded the *Young Phoenix*, Captain Kennedy willingly agreed to take twenty of us to Point de Galle, Ceylon; where, after an agreeable passage, he landed us on the 24th of February. Our thanks are due to Captain Kennedy for the treatment we received on board his ship.

Our rescue had been quickly made known in England: on the 29th of February I received a telegram from home. I should have observed that Captain Giffard, for the time giving up the object of his cruise, steered for the Mauritius; but on the afternoon of the day we left, falling in with the *Childers*, bound for Rangoon, the remainder of our companions were transferred to that vessel, and subsequently shipped for home. We spent some time most agreeably at Point de Galle, receiving great kindness from the district judge, the ship's agent, the Church of England minister, the collector of customs, and other gentlemen. We were, in fact, treated more like friends than castaways, and are not likely ever to forget the attention we received.

I am again in England, and at home, endeavouring to look back upon the wreck of the *Strathmore* merely as an unpleasant dream. G. D. C.

FALLEN FORTUNES.

CHAPTER XXXVII.—JENNY AT BAY.

MR CAMPDEN was upon the whole not sorry to have been left behind by his wife in Sanbeck; the short way to Riverside over the crags was not, indeed, very nice walking in winter weather; but it was no great distance to Bleabarrow, where 'the fly' could be procured to take him home; and he was really glad of being alone with Jeff, and of having a word or two in private with the two girls. Jeff had received no summons to Riverside upon this melancholy occasion—Mrs Campden objected, as a matter of principle, to people running into expenses for mere sentiment—but had invited himself to Dr Curzon's.

'I should like, if it would not be inconvenient to you,' he wrote the doctor, 'to pay the last tribute of respect to the best and dearest friend I have had in the world;' and the doctor had allowed the plea, and welcomed the lad warmly.

He looked something more than a lad now; his life in town had given him an air of independence and self-possession, though without the least touch of conceit. He looked handsomer than ever, though his dark eyes were heavy with woe, and his fair face shadowed with grief, as he walked with little Tony ahead of their two companions, and talked in a low voice of the departed dear one.

With the squire and the doctor, as was natural, the future of the orphaned Daltons formed the chief topic of conversation; and in connection with it, Mr Campden mentioned the offer that had been made by Mr Holt.

'It was a deuced kind thing of the man, that I must say,' observed he, when he had delivered this information, which he felt somehow had fallen flat.

'Very much so,' said the doctor, 'if it was disinterested.'

'There was no promise attached to it whatsoever, my good friend; the offer was made quite free.'

'Still, from what I have seen of Mr Holt,' persisted the other, 'I should think he was a gentleman who looked, in some shape or another, for his *quid pro quo*. Moreover, I believe him clever enough to gauge the nature of those with whom he has to deal. If he lends our young friends money, he places them under an obligation; and there is only one way—as it seems to me—by which that obligation can be discharged.'

'I think you are not very charitable to Mr Holt,' said Mr Campden, with a little flush.

'Perhaps not,' said the doctor dryly. 'Still, I think it hard upon the girl to place her in such a position. Suppose a lovely young woman, for example (and what can be more likely?), advanced me money upon very doubtful security—should not I be bound, if I could not repay her, to make her Mrs C.?'

'I believe you're right, Curzon,' said Mr Campden suddenly: 'it has struck me in the same light, myself. The money, if they want it, shall be forthcoming some other way.'

He gave a great sigh as he said that, as a thrifty man might do who has made up his mind to some extravagance; but Mr Campden was not thrifty; and though he was counting the cost of what he had resolved to do, it was not the expense that made him sigh. If he advised the girls not to take this money, especially if his wife had already persuaded them to do so, 'there would be the deuce of a row,' he knew, with Julia.

'I say, Jeff, what is your opinion of Mr Holt?' inquired the doctor presently, pitching his voice so as to reach the others; 'that is, so far as you can tell it consistently with loyalty to your chief.'

'Ay, we mustn't disclose the secrets of the prison-house, must we?' said Mr Campden; 'how we rig the markets, and all that.'

'I am bound to say that Mr Holt has been uniformly civil to me,' replied the young fellow frankly. 'Nay, not only civil, but considerate. In my ignorance and inexperience, I have no doubt made lots of blunders in business matters, and he has never said a word about them. And this is the more creditable to him, because he hates me very cordially, and he knows that I hate him.'

'My dear Jeff, I am astonished at you!' exclaimed Mr Campden. The doctor looked astonished too, but with a sly twinkle in his eyes that did not speak reproof.

'No, sir; we don't like one another, and we never shall,' continued the young man; 'but I do my duty by him, I hope, and, as I say, I have nothing to complain of in his behaviour to me.'

'Well, I have known many partnerships carried on on worse terms,' observed the doctor cheerfully. 'But how was it that oil and vinegar were got to mix in the first instance?'

'The explanation is very simple, doctor. Mrs Dalton—God bless her!—asked Mr Holt to take me, and advised me to go. And—and—here Jeff began for the first time to exhibit embarrassment—nothing else happened to offer itself.'

For the second time the colour came into Mr Campden's face; he could not but remember the circumstances under which Jeff had been driven

from Riverside. It was quite a relief to him that a bend of the road here shewed them the village—they were now returning from the mere—and once more introduced, by association, the topic of the morning.

'I should like to have a few words with your sisters before I start, Tony,' said the squire, 'if they feel equal to see me.'

'Oh, I am sure they would see you, Uncle George, because'—Here he stopped short; what he had in his mind was, 'because they could see Mrs Campden, who is not half so nice;' but unlike that lady, he sometimes felt a hesitation in speaking his mind.

'Because he is their best friend; eh, Tony?' observed the doctor, hastening to the rescue. 'That is quite right. We three will take another turn together, while the squire goes in.'

Since Mrs Campden's departure that afternoon, the two sisters had not met. Kitty had devoted herself to the baby, and Jenny had remained in her own room endeavouring, in vain, to devote herself to her books. They were both aware that it behoved them to be doing *something*: not to give themselves over to the grief that was importuning them to become its prey. They only shewed their weakness by avoiding the little drawing-room when they conveniently could; since it was there that the sense of loss oppressed them most: the unfinished piece of work; the still open desk; the book half read; the empty lounging-chair, were for the present daggers, each of which stabbed them to the very heart. Perhaps, too, the consciousness of their disagreement—or rather of their want of accord—with respect to the proposition made by Mrs Campden, had helped to keep them apart for that half-hour or so. A quarrel was impossible between them at any time, much more on the very day when they had laid in earth the being they had loved best upon it, and who had repaid their love with such usurious interest. There were reasons, as I have shewn, why these two from the first should not have gone the way of most sisters in this respect; and since misfortune had befallen them, the bonds of love between them had been naturally strengthened and tightened. It is a poor fancy indeed that has painted Love as flying out of the window when Poverty knocks at the door. With those within, if they be not utterly worthless, he remains a more cherished guest than ever. Indeed, it was only their ordinary close affection and unanimity which gave any importance to the difference of opinion between the two sisters; it seemed so strange to each that the other should take an opposite view of any matter.

Jenny on her part had no doubt whatever as to the course they were bound to follow with respect to Mr Holt's offer. If she had thought Kitty was seriously thinking of accepting it, she would have been furious. She saw it at once in the very light in which it appeared to Dr Curzon. 'This impudent man was offering to lend his money upon the very best of security—namely, on Kitty herself. If the offer was accepted, it was in fact the offer of his hand!' What hesitation therefore need there be as to their reply? As to Mrs Campden's making the proposition, that was only to be expected, after what had already happened, and was another reason, if such were wanted, for declining it. Sooner than see her Kitty sacrificed on the altar

to Mammon, for the sake of herself and Tony and the baby, she *would* have 'starved first.'

But besides this bitter feeling, there was a fire kindled in Jenny's breast that flamed against almost everybody; nay, which resented the blows of Fate itself. She had taken it ill in church that day that the Bleabarrow clergyman—of whose cure Sanbeck formed a portion not much visited except in the summer months—should have spoken of her mother's future with charitable confidence. The words of Hamlet addressed to the officiating minister at Ophelia's grave would have expressed her thoughts. What priest on earth had the right to eulogise her mother, far less to hint a doubt of her perfection? As for the outside world, she scorned it: the chill touch of misfortune had withered up her soul, and shut her sympathies within very narrow limits. Her own flesh and blood: Jeff and the doctor: Nurse Haywood and Uncle George, were now all the world held that was dear to her; and even Uncle George was suffering in her opinion as the husband—or rather because he was the slave—of his Julia. Under these circumstances, it was perhaps creditable to poor Jenny that she had been as civil to Mrs Campden that afternoon as she had been.

Kitty, on the other hand, was actuated by different feelings. Her mother's death had left her—until her father's return, of which, however, she at least still entertained a hope—head of the family, and her soul was filled with the sense of that responsibility. The proposition made on behalf of Mr Holt did not strike her with that force and significance which it had for her sister; she saw in it a kindness, unexpected indeed, but explicable enough on the ground of his friendship for her father. She looked upon the money as a loan, not as a gift; and though even so, it would be unpleasant to accept it, she did not think it consistent with her duty to those left in her charge to refuse such an offer point-blank. She had not yet made herself aware how their slender finances actually stood, and therefore could not measure the necessity of the case; and she was solicitous not to lose a friend for her dear ones, and still more, not to make an enemy. That she could be resolute against dictation, when her heart counselled resistance, has been proved by her refusal of Mrs Campden's generous proposal to take the baby off her hands; but Jenny had left the room before she had displayed this fortitude.

It was therefore under some sort of misunderstanding, rather than disagreement, that the two sisters now met in the little sitting-room, having been summoned thither by the squire's arrival.

'My darlings,' said he gently, 'this is a sad day for you; but I thought you would not mind seeing Uncle George.'

The sight of these delicate girls, so pale and mournful, in their simple black dresses, affected him deeply. He noticed that Kitty wept, while Jenny was quite dry-eyed, and yet that the latter looked the more pained and hopeless of the two; that was probably, thought he, because of her physical ailment, poor thing. He tenderly embraced them both, and then spoke some hopeful words about their father.

'Jeff says that it is by no means thought to be a desperate case with regard to the *Flamboyant Head*, even now; and that persons are still found to insure her, though, of course, at a great pre-

mium— Come, come, girls; cheer up: I hope and trust that my old friend may come home to see his darlings yet.'

'Not all his darlings—not the best of them,' moaned Kitty, wringing her little hands.

'I have no hope, Uncle George,' said Jenny quietly.

'Well, well; time will shew, lass. My prayer is, that your poor father may be restored to be your guide and protector. But if it please God to deny this, material matters will, on the other hand, be less untoward with you. His life is insured—though, singularly enough, I never knew it—in a Company of which I am a director, for five thousand pounds. The worst is, that some time may elapse before the proof arrives—that is'—

'We understand,' interrupted Jenny quietly. 'Mrs Campden explained it.'

'Yes, yes; and about Holt's offer, and so on. Well, I have been thinking since, that you might have some hesitation in accepting that. Now, suppose a little arrangement should be entered into between you two and me, no one else knowing anything about it; there would not be the same objection, would there? Here are two hundred pounds—that would be enough, eh?'

'O yes, Uncle George; but'—

'Now, my dear Kitty, it's a loan; you need have no false pride in the matter.'

'But I am not sure that we shall want it, Uncle George, at least not just at present. We shall live very, very quietly now—shall we not, Jenny, you and I? and as for Tony, he will soon be off our hands. It is such an indescribable pleasure to us to think that the poor boy will for the next year or two, at all events, feel no disadvantage from his change of fortune, since you have so kindly offered to send him to Eton.'

'To Eton?' said Mr Campden, reddening. 'Yes; to be sure there was some talk of that. But Mrs Campden was thinking perhaps some other school—I mean in the boy's own interest—might, under the circumstances, be more suitable.'

'O dear; I am so sorry!' said Kitty. 'Papa went away so pleased that Tony was to go to Eton; and mamma—I think, somehow, dear mamma had set her heart upon it. Moreover, Uncle George, you promised it,' observed Kitty gravely.

'Well, my dear, I believe I did, and I should like to do it still; but the fact is, Mrs Campden thinks— However, no matter about that; I promise you the boy shall go to as good a school as Eton.'

'Subject to what Mrs Campden thinks.'

'O Jenny, Jenny!' cried Kitty reprovingly.

Mr Campden's face turned from red to white. It was the first time either of the girls had seen Uncle George 'put out,' except by his wife.

'You should not speak to your father's friend like that, Jenny,' said he severely. 'It is not becoming in a young girl.'

'It is becoming in no one to break his word, and least of all because'—

'Be quiet, Jenny!' cried her sister, with passionate pleading. 'How can you, *can* you talk so, when Uncle George has just been so kind!'

'What Jenny says will make no difference as to that,' said the squire coldly. 'The two hundred pounds are quite at your service.'

'But I am not sure that we shall want them,

Uncle George,' said Kitty timidly, and flushing very much at the sight of Mr Campden's pocket-book. It held the very same notes which had been offered to John Dalton on the eve of his luckless departure from Riverside, and been declined.

'You will certainly want them, my dear,' said he; 'if not to-day, to-morrow. It is ridiculous to suppose that you can keep house—and pay unlooked-for expenses also—on your little income, without any hope of its being increased.'

'We have hope, Mr Campden,' said Jenny slowly. 'And I for my part at least, had rather not take'—

'You talk very foolishly, girl,' interrupted Mr Campden with irritation: 'if you suppose you can earn your own living, you must be mad. I know you are thinking of your lacework; but Lady Skipton was writing about it only the other day to Mrs Campden, and assured her that, commercially speaking, it was valueless.'

It was a cruel thing to say, even in anger, but the squire little knew what pain he was inflicting. The thought that her little private note to Lady Skipton with its offer of the lace had been made the subject of correspondence between her ladyship and Mrs Campden, was gall and wormwood to her. 'That woman' must have known, then, that she had tried to sell her wares in town, and failed.

'It is not the lace at all, Mr Campden, which I have in my mind,' said Jenny, speaking very firmly.

'What is it, then?'

'It is a secret. I cannot tell you what it is, even if you promised not to tell.'

'Jenny, you are insulting me.'

'No; I am but telling the truth; though, if I did insult you, it would be only what your wife did to us to-day, and has been doing every day since we were poor.'

'This is very sad,' said Mr Campden, looking at Kitty.

'Yes, it is,' continued Jenny passionately; 'it is very sad to think that one's friends should be so base. I say these things because I am angry; but Kitty thinks the same, though she does not say them.'

'There is some frightful mistake,' murmured Mr Campden helplessly. The alteration in his wife's manner towards her late guests since their misfortune had by no means escaped him; but he had flattered himself that he alone had seen it.

'A mistake!' cried Jenny scornfully. 'Yes, it is a mistake, and very frightful too, to insult people because they are poor; to patronise them; to endeavour to humiliate them by gifts at the expense of others. That, however, is what one must needs expect of some natures—women's natures. But that a man—a *man*—should promise something to an old friend, and then, when that friend has been lost at sea, and his wife is dead, and his children desolate, should break his word, at the instigation of another—that, I say, is base!'

In her indignation and bitterness, Jenny had risen to her feet. If she had been a strong big woman, red of face and loud of tongue, one might have set her down as a virago; but being pale and wan, and speaking most musically all the while, although her words flowed like a torrent, it was impossible for a man to despise her wrath.

'I cannot stay here to listen to these things,' said Mr Campden, also rising from his seat. 'I came here, Heaven knows, without expecting any such scene—I wished to do you nothing but kindness, and I wish it still—Kitty.'

'I know it, Uncle George, and Jenny knows it,' sobbed poor Kitty; 'only, she was put out by the disappointment about Eton: not on her own account, of course, nor even on Tony's, but because it was mamma's wish that—that—and because to-day of all days'—

'Yes, yes; I see,' said Mr Campden, his kindly nature reasserting itself; 'it has been very unfortunate. But don't let us part ill friends.'

Kitty's answer was to throw her arms about his neck and cover him with tears and kisses.

'Come, Jenny,' said he, 'you will shake hands with Uncle George?'

'O yes; I will shake hands with you—Mr Campden; and I thank you for all your kindnesses in old times.'

'Well, the old times will come again, my girl, some day; and you will be sorry to have been so bitter with us at Riverside, and I should be sorry too—only I shall have forgotten it.'

'No, Mr Campden; you will not have forgotten it, though it is kind of you to say you will; and the old times will *never* come back; they are dead and gone.' The tears came into her large eyes, her voice trembled, her frail limbs gave way beneath her, and she would have fallen, but for Kitty's protecting arm, which in a moment encircled her waist.

'Don't speak, darling; don't worry yourself,' whispered Kitty; 'Uncle George has not gone away angry; there is no mischief done—at least I hope not. And I don't blame you for what you said—no, not one bit.'

Whosoever had deserted them, whomsoever they had lost, these two loving hearts were one, and the stronger for their intertwining.

PRIMITIVE MODES OF CROSSING THE CASHMERE RIVERS.

WHEN Sir Douglas Forsyth and Colonel Gordon, in 1873, went on an Embassy from the Viceroy of India to the Khan of Kashgar and Yarkand, they had to cross some of the most tremendous mountain-passes in Asia, separating the Punjab and Cashmere on the south from Tibet and Kashgar on the north. The mountains form the rugged knot which connects the Himalaya with the Hindu Kush ranges, and are intersected with ravines and river torrents difficult to cross with the rude appliances of those regions—especially for a train of several score men and mules, with baggage of all kinds. The historian of the Embassy, Mr Bellow (army surgeon in the Bengal cavalry), in his recently published volume, gives an interesting account of the contrivances adopted by the natives for crossing rivers where no bridges exist.

The Jhelum, forming at one part the boundary between the Punjab and Cashmere, is, at the point where many travellers cross it, so beset with rapids and huge boulders as to be neither fordable on foot nor passable by boats. The natives use a rope-bridge called a *nāra*, a single cord stretched across from bank to bank, and secured to the top of vertical walls of cliff. The cord is furnished with a loop-cradle slung on it by a forked piece of wood,

in such a way that the cradle, though irremovable, is free to slide backwards and forwards on the line. Mr Bellew watched the movements of a spare half-naked mountaineer in crossing this frail bridge. The man fastened a scanty bundle around his chest with a tattered scarf, and cautiously stepped down to the edge of the rock; pulling the cradle towards him, he seated himself in the loop (for the cradle was really nothing more). With a thrust against the rock, he pushed himself, and shot half across the river by the descending inclination of the rope itself. Arrived there, however, the momentum ceased, and he was brought to a stand. Resting for a moment in mid-air over the roaring and foaming torrent, to still the oscillations of the rope, he seized the cord with both hands, and propelled himself forward by a series of sudden jerks of the legs, grasping the cord a foot or two in advance, and timing the movements of the jerks to the oscillations of the cord. In this way he reached the top edge of the cliff on the opposite side of the river. The cord was nothing but a close, thick, and strong twist, made of a long climbing-plant mixed with the twigs of a species of *Indigofera*; the cradle and shore fastenings were of raw hide. When kept in good repair, these slender bridges, it appears, are very strong, and capable of conveying horses and sheep across the river; the animals are slung in the cradle, and let gently down one slope and hauled up the other by means of a separate rope. Such bridges, however, are only used where the banks are very steep, and the stretch across not very wide.

The members of the Embassy saw the river crossed by some natives at Thandali in quite a different manner. The bank on one shore is only a little way above the level of the river, while on the other it rises almost perpendicularly from the water's edge; there are therefore no facilities for the *nāra*, just described. The crossing was effected by means of a *shindz*, at a time when the river was in full flood, and quantities of drift were being carried along the rushing torrent. The *shindz* is little more than an inflated ox or goat hide—or rather, two hides lashed together; each separately inflated by blowing through a wooden vent fixed in one of the fore-legs of the hide, and closed by a wooden plug. The floating craft thus formed was held on the edge of the river till the rider, striding across it, passed each leg through a loop of strapping hanging like a stirrup-leather on each side; then, keeping his two hands on the two vent-plugs (partly to keep them firm, and partly as a hold), he plunged out into the foaming torrent, paddling along with legs and elbows. Much skill is required to manage these bladder-boats (if such they may be called) in rough water; but the natives who cross the rivers of the Upper Punjab and Cashmere are equal to the occasion. 'We saw,' says Mr Bellew, 'several men out on the *shindz* in quest of the drift borne down by the flood; and to judge from the ease and confidence with which each guided his awkward little craft, they must be practically familiar with its use in this place. The courage with which they buffeted the breakers, and the dexterity shewn in avoiding the whirl of the rapids, were no less astonishing than the skill with which they secured a passing waif, and the firmness of riding displayed as their buoyant supports were borne bounding over the wave-tops. On this occa-

sion, we saw the river crossed under exceptionally difficult conditions. In the ordinary state of the current the passage is a simpler matter; it admits of a bundle being carried on the back of the passenger, who, if he cannot paddle himself over, may be towed across by another who can.'

Another mode of crossing rivers is by the *jhāla*, a sort of swing-bridge. Mr Bellew saw this in use at a part of the Jhelum near Hattayaer, where the river is a hundred yards or so in width, and flanked by high banks. The *jhāla* consists of three ropes stretched across the stream at a height of eight or ten feet above the water; they are fastened to two buttress piers, built up of loose boulders and brushwood fagots. Each pier slopes as a kind of causeway towards the land, but drops as a wall towards the water; whilst in its substance are imbedded several strong upright posts as supports for the three ropes. These ropes are stretched across the river in a mode represented in section by the three points of a letter V, or by the three dots '·'—that is, two upper ropes side by side, and the other midway between them, but at a lower level. Numerous large V-shaped prongs of wood, placed at intervals of four or five yards apart, keep the ropes in their proper relative positions; these prongs are secured by thongs of raw hide, and are further strengthened above by a cord which is passed across from one upper point of the prong to the other.

Such being the construction of the *jhāla*, Mr Bellew saw one of them used as a bridge in the following manner. The ropes hung with a considerable bend by their own weight; whilst the wind swayed them in a somewhat violent manner. A native crossed the river by *walking along the lowest rope*, and maintained his balance with his two hands on the upper ropes, which came about to the level of his shoulders. It was not a performance *à la* Blondin, for the man had the hand-ropes to guide him; nevertheless, it required a nimble use of supple feet to tread in safety such a narrow pathway. Mr Bellew saw four men cross this bridge at the same time, two of them carrying bundles at their backs; they followed one another at intervals of four or five paces, and were careful to 'break step' (as soldiers call it), so as to prevent the dangerous undulations which would otherwise have jerked them off their narrow footing. As they arrived at the prongs in succession, they cautiously ducked or stooped under the cross cords. Only one man at a time was in the space between two adjacent prongs—doubtless to avert over-pressure on so frail a bridge. The weight of the four men, distributed over different parts of the length, was sufficient to bear down the middle of the bridge to the surface of the water, inasmuch that the men's feet were temporarily immersed in wave-crests, and the structure swayed considerably from the action of the men upon it and the waves beneath it. But the natives plodded on without timidity, custom and practice having habituated them to this singular mode of crossing rivers.

One kind of bridge, called a *kaddal*, crossing a river near the chief city of Cashmere, appears to have made more pretension to engineering rank; nevertheless it would be a very primitive affair in our eyes. It is formed entirely of undressed logs of pine and cedar—whole tree trunks simply lopped of their branches. The longest and strongest are laid side by side across the river, resting on rude

piers. These piers, of which there are six, are twenty to twenty-five feet apart; and a length of two or three feet of each end of every log rests simply on them, without any other fastening. The piers are solid blocks or masses of logs, arranged layer above layer alternately at right angles, and every log resting in notches cut in those below; they are somewhat of hour-glass contour, the horizontal section about half-way up being less than at the top or the bottom. The piers repose on a foundation of stones imbedded in the muddy bed of the river, and are protected against the current by a cut-water pointing upstream, and built of loose stones filled into a frame of logs. Upright posts of cedar timber are driven into every pier, and these posts support two hand-railings that run from end to end of the bridge. The cedar timber is very durable, and the rickety-looking fabric is really strong and lasting.

DASHMARTON'S LEGACY.

CHAPTER V.

ALFRED HARVEY reached Friddenden soon after three o'clock, and in an ordinary way would have driven through the town without stopping, and so home. But on this occasion he had made up his mind to see Lucy; he therefore put up his horse at the *White Hart*, and walked down the High Street towards the cottage. On his way he met Spiller. 'Shall I find your sister at home?' he asked.

'No,' said the youth; 'it's holiday afternoon, and she's gone out somewhere; but she'll be home by tea-time. Suppose you come in and share our humble meal—afternoon tea, eh?'

Spiller was thus gracious because he saw in Alfred Harvey the sole chance of any extrication from his embarrassments. If Harvey were engaged to his sister, he would be bound to do something for him, Spiller. It would be a nuisance to be connected with such a loutish fellow; but that could not be helped. There was no doubt that he had plenty of money even now, and would be a rich man when his father died. Tresilian was out of the race now, evidently, Spiller thought, and Alfred was the disagreeable alternative.

Alfred did not, however, eagerly snatch at the opportunity, as one might have expected; for one thing, he was uncertain as to what sort of a reception he would get from Lucy if he appeared under Spiller's auspices. He replied, therefore, guardedly, that he thought he could not stay in town so long, but that if he could manage it he might come. He had an opportunity now to deliver the book, but he did not avail himself of it. No; he would not rashly part with this invaluable passport. If he could only find out now where Lucy had gone, and throw himself in her way as she returned, he would have a chance of a delightful walk; and then, if she confirmed her brother's invitation, an equally agreeable evening might follow. He could not very well make inquiries, however, as to Lucy's whereabouts; he must trust to his own judgment and good-luck for hitting the right direction. It was most likely that she had gone as far as Tattenden—that was her favourite walk, and Alfred knew and respected the motive that took her there. But by strolling along gently

in that direction, he would probably meet her about half-way.

The young man had calculated pretty correctly; before he had traversed half the distance between Friddenden and Tattenden, she whom he sought appeared in the distance coming towards him. The sight of her figure robed in black, her slow, listless step and despondent attitude, struck him with compassion. How different she had seemed a few short months ago, with her gay humours and imperious ways, her coquettish costumes, her style and independence! She saw him now, and would have turned aside if she could; but there was no other way open to her, and she must meet him perforce. She quickened her step, and assumed a bearing more erect and defiant: her face was a little flushed, but that might be owing to the fatigue of the walk.

'It is a happy accident this,' said Harvey, raising his hat as they met; 'I wanted to see you so much.'

'You have returned from your father's, then?' asked Lucy, in an indifferent tone of voice. 'How did you leave them at home?'

'Oh, all right,' replied Alfred, ungratefully forgetful of his father's indisposition. 'Father was coming back with me, only he was too ill.'

'A moment ago you said he was all right.'

'Yes; I forgot. Father is very ill.'

'I am very sorry,' said Lucy. 'What is the matter with him?'

'Something rheumatic, I fancy,' replied Alfred. 'Oh, he'll get over it all right—he has these attacks constantly.'

'That does not make them the less dangerous. Has he proper advice?'

'He does not want advice, bless you; the old man doctors himself beautifully. Makes it awkward though, this time, because he was coming to the sale to-morrow.'

'What sale?' asked Lucy. 'O yes; I remember now,' she added with a sigh.

'But I'm to act for him. I say, Lucy, it's on the cards that you might be mistress of Mordieu again, if you like.'

'That is very improbable.'

'I said if you liked, you know.—No; you needn't turn away, Lucy. I'm not going to harp any more on that string—not just yet. Do you know I've been thinking very seriously over what you said the other day, and I've come to the conclusion that I was a great bear on that occasion. You offered me friendship—the affection of a sister. Well, I was for flinging them away. I've thought better of it since. Let me be your friend—your brother.'

'I am glad you have come to your senses,' replied Lucy.

'And then, you know,' went on Alfred, 'I can come and see you as often as I like.'

Lucy shook her head vehemently. 'No; that would not be a friendly part,' she said; 'not at all. True friendship would be to leave me to myself—never to come near me—not to talk of me, think of me even.'

'That's impossible.'

'But you must make it possible. Don't you see that it is cruel in you in my position to persecute me? Don't you see that your visits are remarked, that even now, the gossips of the town will say that I came here to meet you?'

'I'll go home the other way, if you like,' said Alfred, stopping short.

'No; that would make it worse. Don't think that I care about idle chatter; but with me, it may take away my daily bread.'

'And why won't you let me make you independent of all these chatters, Lucy? You've only a word to say.'

'There, again; you see you are not to be trusted,' sighed Lucy sadly.

'I won't say another word,' cried Alfred; and indeed, he walked on doggedly a long way in silence, till they came in sight of Friddenden church tower.

'Spiller—I met him just now in the town—said something about coming to have a cup of tea; but I wouldn't say "Yes" without knowing whether you'd like it,' remarked Harvey humbly.

'Don't, this afternoon,' said Lucy; 'I have such a dreadful headache.'

Not another word was spoken till they reached the door of the cottage, when, as Alfred held out his hand in farewell, Lucy turned suddenly upon him; the question had been on her lips during all their walk.

'Have you taken away a book of mine?' she asked.

'Yes, I have; it's in my greatcoat pocket, and that's in the dogcart. I'll go and fetch it directly. Or shall I bring it to-morrow?—I shall be passing this way.'

'Yes; bring it to-morrow—to-morrow,' responded Lucy faintly; and Alfred saw that she turned quite pale, and leaned against the railings of the garden gate for support. Next moment, however, she had disappeared into the house.

Harvey had not gone far before he met Mr Elkins and Lord Tancanville coming down the High Street, followed at a little distance by a young man in plain clothes, but rather of the policeman type. Perhaps it was the sight of Mr Elkins that had discomposed Lucy, and no wonder!

'Ah, this is Mr Harvey,' explained Mr Elkins to his lordship; 'one of our best tenants.'

Tancanville waved his hand affably. 'Glad to see you, Mr Harvey.'

'And by the way,' went on Elkins, 'he is the very man who is likely to do our business in a better way than we can ourselves.—Mr Harvey,' he said, addressing Alfred, 'can you spare us a few minutes?'

Harvey replied that he could; and the whole party returned to the *White Hart*, where they entered a private sitting-room. 'Wait outside, Streeter; if we want you, we will call you in,' said Elkins, as they entered. Streeter touched his hat and remained by the door.

'We understand, Harvey,' said Elkins affably, 'that you are the principal friend and adviser of these unfortunate young people, the Dashmartons.'

'I am quite ready to act in that capacity,' said Alfred; 'but I hold no appointment of the kind from them.'

'Precisely so; you will act in that capacity. That is all we want. This is an irregular unofficial line of proceeding altogether; but it is Lord Tancanville's wish,' intimated Elkins, turning in his lordship's direction.

'Yes, my wish decidedly, Elkins,' returned Lord Tancanville, drawing forth a tortoiseshell

snuff-box and helping himself copiously. 'Quite my wish. Go on, Elkins.'

'Well, the statement I have to make is a very painful one, but our duty to the estate leaves me no option but to make it. We have reason to believe that concealment has been practised by somebody—that Dashmarton was at the time of his death in possession of a considerable sum of money which has somehow disappeared. Now, we neither promise nor threaten; we accuse no one, we exonerate no one; but we desire, before taking the ultimate proceedings that may seem advisable, that these young people—you understand—should receive a gentle warning and a caution—at least that is Lord Tancanville's wish.'

'Decidedly my wish, Elkins,' said Lord Tancanville, taking another pinch.

'Now, is it not better that this inquiry should be made in a friendly way through you, than by some inferior agent; the young man outside, for instance, who is, I don't disguise the fact, the agent of a private inquiry office?'

'The question itself is somewhat of an insult,' said Harvey. 'As far as the young lady is concerned, I would venture all I possess upon her honesty. Everything was given up without demur.'

'Yes; everything that it was impossible to conceal. But as I said before, we accuse no one. We only want to have the question asked: "Do you or do you not know of the existence of any sum of money formerly in the custody of John Dashmarton, and received from him directly or indirectly?" Now, is it better that this question should be asked through a friend like yourself, or through an agent like the man outside?'

'You put me in a very awkward position,' said Alfred. 'But, sooner than the Dashmartons should be exposed to the visit of this detective, I will undertake the mission.'

'You understand,' said Elkins; 'first the question, then the warning. If the money exists and is not given up, then the law will be put in force. We have good information, and shall strike quickly and firmly.—I believe I have expressed Lord Tancanville's wishes in this matter?' went on Elkins, bowing once more towards his lordship.

'Yes; my wishes decidedly, Elkins: you have put them exceedingly well.'

'Then in half an hour, Mr Harvey, we may expect to have some definite reply. If all knowledge is denied, a simple "No" will be sufficient. If otherwise, it will be necessary to go into details.'

'I could write the "No" in advance,' said Harvey; 'but, as I have undertaken the matter, I will go through with it.'

This conversation had almost driven out of his head the book that he had left in his greatcoat pocket; but he recalled the matter before he left the inn-yard, and took the volume with him under his arm.

Emily opened the door of the cottage, in answer to his knock, and shewed him into the little parlour. 'She'll be down in a minute,' said the little maid, in a confidential tone.

There was nothing in the appearance of this humble sitting-room to justify the surmise that any large portion of misappropriated money had been sunk in its adornment. Half-a-dozen cane-chairs; a piece of neat drugging on the floor; a square table of stained deal, with a cloth cover; a

few common vases on the mantel-shelf; a distorting mirror over the fireplace: these did not look like the rewards of successful fraud—of the plunder of other people's money-bags.

Lucy entered with an air of surprise at seeing Alfred thus returned. 'You have not taken all this trouble about my book?' she said.

'No,' replied Alfred, with a kind of forced laugh. 'I have just met a little company of lunatics, who have commissioned me to ask you a question, which I should have declined altogether to do, had I not hoped to save you from annoyance.'

'You are very kind. Pray, what is the nature of the question?'

'Well, these people, who are acting for the trustees of the Chilprune estate, have got it into their ridiculous heads that—in fact, that there was money left at your father's death which belonged to the estate, and that some one has taken it and concealed it. Now this, of course, is all nonsense. You know nothing about it?'

'No; I know nothing about it,' repeated Lucy mechanically.

'Of course not. I knew that it was all a parcel of idiotic rubbish,' said Alfred triumphantly. 'Miss Dashmarton, pardon me for having asked you such an insulting question.'

'If I had taken the money it would have been'—Here Lucy paused.

'Yes, it would have been a downright robbery. Fancy you a robber, Lucy! I should mistrust my own mother next.'

'But if one had done such a thing,' asked Lucy, 'what would they do to one?'

'Oh, I suppose it would be an affair for the assizes,' returned Alfred carelessly.

At this moment Spiller came in: he looked keenly from one to the other. 'What! you've come to spend the evening, Harvey, eh?'

'No,' interrupted Lucy. 'Mr Harvey has come to inquire about the secret hoard, Spiller.'

'Ah, the purse,' cried Spiller; 'I wish I could find it out.—Don't you, Lucy?'

'By the way, here is your book, Lucy,' said Alfred, rising to take his departure.

'Ah, yes, the book!' cried Lucy, looking at it in dismay. 'But the cover—what have you done with the cover?'

'Let me see. What did I do with the cover? Chucked it into the road, I fancy. Thinks I, when I saw it on my book, as I thought: This is some of mother's handiwork; and I was for pitching it into the road.—No; but I didn't throw it away, Lucy,' he added hastily, seeing an unaccountable look of distress upon her face. 'I've left it in my greatcoat pocket, and I mean to keep it. I shall put it on my own book, and I shall always think of you when I take it up.'

Miss Dashmarton followed Harvey to the door. 'Will these people, do you think, take—any other measures? What will they do next?'

'O yes; I forgot,' replied Alfred cheerfully. 'They have got a detective down here. But don't fear, Lucy; he can't hurt honest people; and if he fears you any annoyance, send for me.'

'Perhaps they will watch the house?'

'I shouldn't wonder. It will be fun if they do.'

'Yes, it will be great fun,' repeated Lucy, with a quaver in her voice.

'I should like to see 'em come to my house,' said Alfred, 'with a search-warrant perhaps. Being your nearest friend, Lucy, why shouldn't they? Wouldn't I have a nice game with them!'

'Alfred, send me that cover back now at once. Promise me,' entreated Lucy.

'Indeed,' replied her lover banteringly, 'I shall promise nothing of the kind;' and with these words he took his departure.

(To be continued.)

GAMES ON HORSEBACK: POLO AND TENT-PEGGING.

THE thought might possibly occur to some of us that horse-soldiers, subject to a considerable amount of muscular exercise in the course of their professional duties, would be loath to engage in sports of an equestrian character involving a still greater demand for bodily activity. And this is perhaps the case among the rank and file of cavalry regiments, who groom their own horses, and have much drill and exercise to get through every day; whereas the officers have their horses groomed for them. Be this as it may, some equestrian games find much favour with officers of cavalry regiments.

One such game is *Polo*, sometimes familiarly known as *Hockey on Horseback*. It is a newcomer in England, but has been long known in Asia, where wide-spreading plains offer ample space for the galloping and rushing about of horsemen. It is admitted in India to be good drilling as well as an exciting amusement; for it gradually gives dexterity in the use of any weapon held in the hand; it requires the player to keep a firm seat in his saddle; and it teaches him the art of turning quickly and striking to the right hand or the left. True, the weapon is only a kind of hockey-stick, instead of being a lance or a sword; still its use accustoms him to a rapidity and pliability of movement likely to be useful in the *mêlée* of battle. British cavalry officers first took up the game a few years ago in the Punjab, when stationed at Lahore; and it was so well liked that regiment after regiment adopted it; the officers found it a pleasant change from the few amusements open to them.

Polo appears to have been first played in England four years ago, when the officers of the 9th Lancers (who had learned it in India) introduced it at Woolwich, and engaged—perhaps indoctrinated—the officers of the Oxford Blues, or Royal Horse Guards Blue, in a contest. In the summer months of the next three years, the younger officers in other regiments took up the game.

We are a famous people for clubs, we English. Rowing and yachting, cricket and croquet, archery and golf, swimming and skating, four-in-hand driving, bicycle riding, pigeon-shooting, athletic sports, chess, billiards, all give rise to the formation of clubs; and these clubs impart a definite character to the several sports or games by agreeing to and laying down rules or laws for play. So it is with Polo. A Royal Polo Club has been formed, the members of which opened a special ground, two years ago, at Lillie Bridge near London. A little farther away from town, near Fulham, stands a mansion known as Hurlingham House, with pleasant grounds bordering on the Thames; it used to be a private residence, but is now the property of the Hurlingham Club. This club—

rather exclusive in its organisation—is primarily a pigeon-shooting brotherhood; but about a year ago there was appended to it a Polo Club, provided with a suitable piece of ground. These Polo Clubmen may or may not be military officers, but they must necessarily be expert pony-riders—ponies being employed instead of full-grown horses.

Thus it has arisen that Polo contests are now mentioned in the newspapers during the summer months. The Royal Club, the Hurlingham Club, and a team known as the Monmouthshire, get up matches among themselves, and also try their strength against others—the Royal against the 9th Lancers, the Household Brigade against the Monmouthshire, the Life Guards against the Royal Horse Guards, the Hurlingham against the 17th Lancers, the Scots Greys against the 12th Lancers, and so forth. Some of our legislators, who can ride horses as well as make speeches (perhaps better), have organised contests *Lords v. Commons*. And if the game should obtain a firm footing amongst us, it may possibly extend to other classes of horsemen (or ponymen). On a few occasions, royalty has witnessed the play at Lillie Bridge and Hurlingham; and the gratification of the victors is not lessened by receiving a silver cup or other prize from the hands of a princess.

The play so far resembles *La Crosse* (recently described in the *Journal*), that the field has two goals at opposite ends; but the two upright posts of each goal are much farther apart in Polo. There is a resemblance also in this—that the players of each party endeavour to drive a ball through the goal belonging to their antagonists; if this be done, they 'make a goal,' and thereby score a game. A game may last an hour or more, or four or five goals may be won in the same space of time, according as the fortune of war may tend. There is a uniformity of dress among the players on each side, to distinguish them from those on the other. Each player holds in his hand a stout stick, having a curved hook at the lower end; it is not long enough to touch or strike a ball on the ground without the rider stooping somewhat; and he must learn to stoop to the right or left with equal facility, and to strike the ball forward, backward, or sidewise. The ground is three or four hundred yards long, and nearly as wide. The ball is dropped on the ground exactly midway between the two goals; and then the two sets of pony-riders gallop forward, each endeavouring, by means of repeated strokes, to drive the ball through the enemy's goal. The riders, usually about five on each side, become so intermingled during the struggle, and wheel about so suddenly, that mishaps once now and then occur—happy if only a 'spill.' As a safeguard against kicks during the scrimmage, the legs of the ponies are thickly bandaged.

From the nature of the sport, it is evident that any ten or twelve players might agree to such rules of play as they please without regard to outsiders; but it is always found in practice that more pleasure is in store for players, if all the clubs agree to the same set of rules; seeing that club can then contend against club, and holiday meetings be better held. Some few months ago the rules of the Hurlingham Polo Club were printed, after several modifications; and we will briefly notice them, stripped of their formal technicalities.

The two sets of players are to be drawn up behind their respective goals, and to start for-

ward on a flag being dropped as a signal. None but players and umpires are allowed to be within the bounds of the field or ground. The ponies ridden by the players must not exceed fourteen hands high. The goals are not to be less than two hundred and fifty yards apart; the space between the two posts of each goal eight yards. No spurs to be allowed with rowels, except on special occasions sanctioned by the committee. Each side nominates an umpire, unless it be mutually agreed to play with one instead of two. The decision of the umpire or umpires is to be accepted as final. The ball to be used is three inches diameter; and sticks as well as ball must be approved by the committee. No player is allowed to hook an adversary's stick, either across or under the adversary's pony. Should a player's stick be broken, he must ride to the appointed place where a new one can be obtained (his team, we presume, being deprived of his services for a few minutes). If a player drop his stick, he must dismount to pick it up, but must not strike the ball while dismounted. A player may interpose his pony before his antagonist, so as to prevent the latter from reaching the ball, whether in full career or otherwise—despite the immediate neighbourhood of the ball. A player is 'before his side,' if in front of the player on his own side who is hitting the ball, and has not two of the opposite side between him and the enemy's goal; in this and in some other cases, he is pronounced 'off his side' or out of the game; he cannot regain his privileges, and become 'on his side' again, until a hit at the ball has been made. When the ball is driven past either side of the goal instead of through it, the side defending that goal are entitled to a hit-off. When the ball is hit out of bounds, it must be thrown in again by some impartial person (not interested in the success of either team more than the other). The dress of the Hurlingham Club Polo-players consists of light-blue jersey, light-blue forage cap with silver band, light-blue belt, breeches, and Blucher boots. In any match between two teams of the Hurlingham Club, one team is to wear red caps instead of blue, the better to distinguish them.

It is a source of amusement to those who have not risen to the dignity of 'experts,' to read the compound of enthusiasm with technical lingo contained in a professional description of any contest at a game or sport. This applies to Polo as well as to Rowing, Billiards, &c. Take the following, which almost makes the reader believe that he himself is a Polo-player: 'Mr Brocklehurst, although he sprained his ankle, pluckily remounted, and a long run followed—down the ground, then back again; then Blue for the second time being within an ace of making the goal. The ball was again struck off by the Lancers, and some fine rallies followed: the play for a long time being in the centre of the ground. Twice the Lancers got the ball to the end, but their opponents brought it back; and after a short scrimmage, Mr Brocklehurst got the ball well away, and by some clever manœuvring soon had it in a line for the goal, but unfortunately missed a well-intended winning hit. Again the Lancers made a gallant charge, and got the ball on neutral ground. Good play then followed on both sides;' &c.

In our busy towns and cities, space has become too valuable to allow much scope for Polo-playing;

but there is no reason why, in country districts, the game should not be encouraged. Good horsemen are to be found amongst us, outside as well as in the ranks of cavalry regiments.

Another game for horsemen, still more recently introduced into this country than Polo, is *Tent-pegging*. The name is a somewhat clumsy one; for to peg a tent is to fix it by means of pegs driven into the ground, whereas the game consists in forcing a peg out of the ground. However, let this pass; perhaps 'tent-pegging' is the nearest equivalent to the oriental name *Ness-base*. The Turcomans, Afghans, and other tribes of Central Asia, as well as the Sikhs, Mahrattas, and Scindians of India, have long practised this game. Passing so much of their time as they do on horseback, they are just the men to appreciate it, and to know its value as a drill-training. They must learn to keep a good seat, to train the eye in measuring distances, to be firm in grasping the lance, yet nimble in using it, and to have steady nerve.

The British officers stationed in India had often witnessed the game, especially among the Irregular Horse of the Anglo-native regiments, comprising many first-rate horsemen and splendid players. It was thought that, during the leisure hours of a camp, tent-pegging might form a pleasant alternative to the strangely named *pig-sticking*. This said pig-sticking (in which the Prince of Wales tried his skill during his recent visit to India) is really boar-spearing on horseback. It is said to combine the excitement of steeple-chasing with that of fox-hunting. Old boars are cunning fellows; having been once hunted, they are difficult to dislodge, and often refuse to budge out of their lairs into the open ground, whatever may be the array and the noises of the beaters. To prosecute a successful hunt, a line of spearmen get well under cover, and a signal is given by a party of scouts; a line of beaters advance, sometimes silently, sometimes to the sound of noisy instruments, as the nature of the jungle or bush seems to render most expedient. It is the beaters' work to drive the boars into the open. When a boar appears, a shout is given by the beaters, and the spearmen gallop up. On they go, boar first, spearmen following, helter-skelter over the open ground—a well-trained horse enjoying the sport as much as his rider; until at length one of the party drives his spear into the discomfited boar—not always without bringing his horse or even himself to grief. A horseman accustomed to the use of a spear or lance in this way is on the high-road to being a good tent-pegger. Lord Napier of Magdala encouraged the British cavalry to try the game in the Punjab. The 5th Royal Irish Lancers began it at Sealkote three years ago, and acquired a fair amount of skill; they were followed by the 4th and 11th Hussars, and these by other regiments of horse. It is found that only a few men in each corps become really skilful at it. When the 5th Lancers returned to England last year, they brought the game with them, and played it at Hurlingham in presence of the Prince of Wales and the Duke of Edinburgh.

However difficult to play, there is but little to describe in the game. A wooden tent-peg is driven into the ground, with the upper part protruding a certain number of inches. A horseman gallops past it, lance in hand; he stoops, lowers his lance

to a sufficient distance and at a proper angle, and aims the point right at the peg. If the aim is a good one, he forces the peg out of the ground, and wins the game, or scores one towards his game; but there are many chances to one against his exactness in direction, angle, and force, while rushing on at full speed.

THE MONTH:

SCIENCE AND ARTS.

TWENTY-SEVEN years ago, when Lord John Russell was Prime Minister, he wrote a letter to the President of the Royal Society to the following effect: 'The government are continually appealed to for assistance in carrying on scientific inquiries and mechanical inventions. We are not qualified to judge of the merits of the schemes thus presented. Would the Royal Society undertake to distribute a thousand pounds, if voted by parliament, among applicants who might be considered deserving of assistance?' The Royal Society undertook the offered trust; and thus originated the Government Grant Fund, which, voted annually by the House of Commons, and administered by a numerous Committee of the Society with habitual painstaking, has aided in the increase of 'natural knowledge,' in tedious and difficult investigations, and in bringing the results before the world. Reports of the expenditure, with particulars of the sums allotted, are published in the parliamentary blue-books, and in the *Proceedings* of the Royal Society. These Reports make it clear that the Society use no part of the money for their own purposes, nor in payment of salaries; but that all is spent in the advancement of science. There was one year in which they declined to receive the one thousand pounds, the applications for aid having been too few and unimportant.

To this annual grant it is now proposed to add four thousand pounds a year during five years, in pursuance of the recommendations of the recent Science Commission, in order to fulfil what some people regard as a duty that government owes to science. It will also be a more or less instructive experiment on the 'endowment of research' question. Five years will suffice to shew whether there are anywhere in the realm mute inglorious Herschels, or Daltons, or Faradays, who by a touch of gold are to be stimulated into scientific activity. It is arranged that the government are not to hand over the four thousand pounds, but are to make allotments therefrom under the advice of the Royal Society.

From all this it is clear that the time has come when any person struggling to accomplish really good scientific work may apply for assistance with reasonable hope of success. If dreamers and over-sanguine speculators apply, and fail to make out a good case, they must submit to be disappointed. And it would be well that the advocates of endowments should moderate their expectations. There is much to be said on the other side. Adam Smith, whose wisdom has long been recognised, expressed his views on the subject to a former generation. What those views were was made apparent at the 'centenary' meeting recently held in honour of the sagacious thinker. At that meeting, the foremost political economists of Europe united in recognising the merits of the

obscure Glasgow professor who, as one of the speakers remarked, 'after Shakespeare reflects most honour on England.' It will perhaps surprise many readers to learn that the same obscure professor was as far in advance in his views on education as in those on the Wealth of Nations. As Mr Lowe eloquently said: 'He' (Adam Smith) 'attacked the doctrine of fostering education by endowments. He says if you do this you make a man lazy, and he will not work. He says people should be at liberty to find out where people will teach them the things that they require, and that the Scholarships and Fellowships, and all eleemosynary attractions of that kind, should not be connected with particular places, forming a bribe to people to go to those places, independently of whether they get good instruction there or not; but that their possessors should be allowed to take them with them wherever they go, if they have once fairly earned them by competition. That if a man goes to a college, and he finds that it is not a college suited to him, he should be allowed to quit it and go to another, so that there might be competition between one college and another, and the choice between them should be within the pupil's power.' Adam Smith wrote thus a hundred years ago, and the nation may well be proud that produced such a thinker.

Dr Forbes Watson, Director of the India Museum, is pushing into notice a project which, whatever else may be said of it, deserves careful consideration. It is to build on the Thames Embankment between Whitehall Place and the Board of Trade a stately building to contain the India Museum and the Museum of the Colonies. There is already, as many readers know, an India Museum at South Kensington; but as Dr Forbes Watson argues, the unsuitability of the building, and the distance of the locality from the centres of public and of business life, render it impossible to give a practical effect to any plan of organisation which would develop the full usefulness of the India Museum as a public institution. And with this it is proposed to combine the Indian Library, the Royal Asiatic Society, and an Indian Institute for lecture, inquiry, and teaching. Thus, in one building there would be brought together 'the whole of the materials available in this country for the study of Indian literature, arts, sciences, and history, as well as for the investigation of its present political, social, and commercial condition.' Then, when we consider the wide range of our colonial possessions, the diversity of their resources and of their products, we become aware that the proposed Museum for the Colonies would be instructive and interesting to an extent scarcely to be imagined. Any one requiring further information will find it in Dr Forbes Watson's pamphlet, published by Allen & Co.

If the building here proposed and a new Mint were erected on the embankment, that spacious thoroughfare would be still further embellished. The Deputy Master of the Mint in his last annual Report makes an earnest appeal for a new building. The demand for coinage is now so great that the old Mint on Tower Hill and the machinery therein are no longer fit for their purpose. The number of pieces coined in 1875 was more than thirty millions and a half, exclusive of bronze coins struck at Birmingham by private contract; from which a notion may be formed of the work

required. During three weeks the machinery was stopped for repairs, and much loss and inconvenience were occasioned by the consequent suspension of coinage. Another point for consideration is that coining has become a scientific operation in comparison with what it was formerly; hence a proper building and the best machinery are essential to answer the requirements of the present day. Tests are now so delicate, that the debasement of the standard arising from absorption of oxygen during the pouring out of the molten metal can be detected.

In 1875 there were melted at the Mint and cast into bars ready for rolling, twenty-six and three-quarter tons of gold; of silver, one hundred and fifty-six and a half tons; and of bronze, two hundred and twenty-four tons.

The question of a fireproof building material seems as if it were about to be solved, if statements made at meetings of the Institute of British Architects may be accepted as evidence. The material is concrete. An instance was mentioned of a building which had been completely gutted by fire; but the walls, constructed of Portland cement concrete, with ironwork imbedded therein, 'withstood the fire perfectly, and were the only parts that did withstand it.' It has been proved by conflagration and by experiment that iron doors will not resist intense fire. They warp and eventually crumble away, while concrete doors remain unaffected. It would now be possible to construct a warehouse or any other building entirely of concrete, for stairs, window-frames, door-frames, and indeed nearly every part may be finished without the use of wood. In St Paul's Cathedral that portion of the dome open to the public is shut off from the other part by fireproof doors of concrete.

In the present state of the labour-market, a means of diminishing quantity of material and cheapening construction can hardly fail to be acceptable. Mr Lascelles says he 'is sanguine of being able to build four-roomed cottages, of a respectable and ornamental character, at a prime cost of one hundred pounds each.' In these cottages the walls are not more than one inch thick, and yet they resist damp perfectly, which is more than can be said of nine-inch brick walls. He says, too, that where a number of window-frames are wanted, it is cheaper to make them of concrete than of wood.

In Canada Buildings, Westminster, there are concrete doors, 'moulded on the face in six panels, thin, light, and perfect in surface, ringing with a clear metallic sound, apparently quite homogeneous, and as perfect in appearance as any ordinary material.' Concrete can be used for roofs as well as for walls and floors. Mr Tall states: 'I determined to see how far I could go on constructing roofs sufficiently thin to answer the purpose of a slated and timber roof. My first experiment was on two small dwellings at Dulwich. Those roofs were completed last autumn; they have stood the heavy rains and great weight of snow of last winter, and I can positively assert that not a crack or drop of water (inside) has made its appearance. The roofs are as sound as on the day they were finished. On one occasion I allowed the rain to accumulate on the roof till it ran over the parapet, and the result so increased my confidence, that I am building two more houses of a different class. There is no thrust on the walls, there are no slates to blow

off, and no repairs are required.' Of course all this implies that really good concrete shall be used. Readers who wish for further information should procure the *Sessional Papers*, published by the Royal Institute of British Architects, Conduit Street, London.

The two special assistants of the Sanitary Commissioner with the government of India have published a Report on 'The Soil in its Relation to Disease,' which has especial interest, inasmuch as it may be regarded as a commencement of observations of telluric meteorology. The air above the surface of the earth, as everybody knows, has long been the subject of observation. In the present case we have observation of the air below the surface, chiefly with a view to ascertain the fluctuations in the amount of carbonic acid in the soil, and whether it was affected by rainfall, by the general water-level, or by wind.

The observations were made by means of tubes buried at a depth of three feet and six feet in the alluvial soil on which Calcutta is built, and were carried on through an entire year. Similar observations were made at Munich during the same period; and the results have been compared. In Munich the points of maxima and minima appear to be determined by temperature; in Calcutta by moisture. There were two maxima and two minima within the year. No definite effect could be traced either to temperature of the air, of the soil, or to the movement of the wind; but a 'general coincidence of conditions' was found between 'the principal periods of rainfall' and 'the principal periods of elevation in amount of carbonic acid,' and the reverse. A similar effect is produced by the general water-level. But it is to be remarked that it is the lowermost stratum which is most affected by the water-level, and the uppermost by the rainfall.

Two sets of observations were made at the same time, in localities about fifty yards apart: hence one set could be used as a test for the other. An important fact was discovered—namely, that the amount of carbonic acid in the soil varies in different localities. In this case the distance was not great, and the sites were at similar and corresponding distances from one and the same building; and, to quote the Report, 'the processes going on in the soil in the two places must have differed materially, in degree at all events, if not in kind; and if such processes occurring in the soil have any influence on health, it is obvious that people inhabiting one end of the building must have been exposed to different hygienic conditions from those living at the other end.' Here we have a fact that deserves serious consideration, for it may have a bearing on the apparently inexplicable isolated-outbreaks-of-cholera question: instances of which occur every summer in India.

In all cases of observation of natural phenomena, long series are required before their significance can be discovered; and so we must have years of observation of underground meteorology if we are to find out their value and learn to apply them. Enough is at present known to make it worth while to carry on systematic observations in different countries, and thereby accumulate data for test and comparison. The authors of the present Report, Dr Lewis and Dr Cunningham, have made a good beginning, and by means of tables and diagrams they enable readers to verify their conclusions. We hope their example will be followed.

Is there anything in the differences of carbonic acid in the soil, which would help to explain some of the puzzling phenomena in Dr Tyndall's experiments on diffusion of germs?

An American doctor of medicine having heard of the discovery made in France, that pain could be relieved by hypodermic injections of cold water, resolved to try the experiment. His first case was a woman who, during three years, had suffered so severely from lumbago that she cried out with pain on the slightest movement of the muscles of the back. The doctor injected ten drops of cold water under the skin in the lumbar region, on each side of the spinal column, and in less than a minute the patient felt relief. 'She stood up without pain, sat down without assistance, and in less than five minutes after the injection, picked up a pin from the floor with ease.' Some time afterwards, the pain returned, but was mitigated the next day by acupuncture without injection, and the woman who had been so long crippled was able to work at a sewing-machine. Another case was rheumatism of the ankle-joint, cured by injection of ten drops of cold water; and a third was nodular rheumatism, involving the shoulder, elbow, wrist, and knee-joint of the right side. Here, again, the injection of cold water gave relief within five minutes. 'I repeated these injections,' says Dr Dessau, 'two days after, when the left knee was attacked, with a like favourable result. In all these cases, slight complaint was made at the moment of injecting the water, of a burning sensation; but not more, I imagine, than when any other fluid is used for a like purpose. In this last case, I injected ten syringefuls of water at one visit, so there is no danger from the quantity employed.' It certainly is a most valuable and ready means of relieving pain, particularly in rheumatic cases. Full details of these and other cases are published in the *New York Medical Journal*, No. 135.

The same periodical contains further accounts of cure of cysts and tumours by means of electricity. Ovarian tumours even yield to this potent remedy. Dr Semeleler, after describing cases successfully treated, remarks: 'Whenever two needles connected with the poles of a battery are introduced into a solution of salts, into any liquid that contains albumen, into a blood-vessel, into a tumour filled with a liquid, or into any animal tissue, a decomposition takes place. . . . I believe that under electrolysis in the ovarian cyst something must take place like that which results in an albuminous fluid by the introduction of both poles. Not only is the liquid resorbed, but the very wall of the cyst undergoes such a change that further secretion of liquid is brought to a standstill.'

A notion has got abroad that billiard balls are explosive, because artificial ivory is made from a preparation of gun-cotton. We are assured by Messrs Orme and Sons of Manchester, who advertise themselves as sole agents for the sale of the 'cotton billiard balls,' that there is no danger in the use of this artificial ivory, and that the balls cannot be made to explode, even by smashing under a steam-hammer.

In answer to inquiries, we mention that economical gas-burners can be procured from J. Scholl, 41 Berwick Street, Soho, London.

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